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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/826,582 | 04/16/2004 | Rolf Pfeifer | 3926.081 | 1763 |

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| EXAMINER | |
|---|---|
| LIN, ING HOUR | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 1725 | |

DATE MAILED: 05/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/826,582 | PFEIFER ET AL. | |
| | Examiner | Art Unit | |
| | Ing-Hour Lin | 1725 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *07 February 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *21-40* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *21-40* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 21, 25-27, and 30-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Langer et al in view of Goldsmith.

Langer et al (col. 3 lines 14+) teach the claimed casting mold and insert (core) for casting metals including porous ceramic produced by selectively sintering on binder coated ceramic particles, and teach methods of producing a green casting mold by rapid prototyping method including 3D-CAD construction (col. 9, lines 23+), comprising: coating polymer binder on a powder layer 6a-6d of ceramic particles (curable molding material 3 including zirconium oxide (ziconic sand and silica sand), deposited on the support plate 5 (see Fig. 8); and laser sintering on

the powder layer of the coated ceramic particles. Langer et al fail to teach the use of mixture including coarse ceramic particles and fine silica in a sinterable powder layer.

However, Goldsmith (col. 4, lines 30+) teaches the use of sinterable powder layer (memberane) having mixture including coarse ceramic particles and fine particle including silica for the purpose of providing smaller size of ceramic particle in the mixture in order to lower the sintering temperature of the green powder layer (memberane) so that the sintering shrinkage during firing the green powder layer (memberane) can be reduced. For example, alpha alumina particles with size above 1 micron having sintering temperature over 1500° C is reduced to less than 1300° C when the size of alpha alumina particles is reduced from 1 micron to the size in the submicron range (col. 5, lines 44+). It would have been obvious to one having ordinary skill in the art to provide Langer et al the use of mixture including coarse ceramic particles and fine silica in the sinterable powder layer as taught by Goldsmith in order to effectively prevent sintering shrinkage and produce moldings having quality of precision.

4. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Langer et al in view of Goldsmith an further in view of Horton.

Langer et al in view of Goldsmith fails to teach the use of a particular relative size between the coarse ceramic particles and fine particle.

However, Horton (col. 4, lines 30+) teaches the use of a particular relative size between the coarse ceramic particles and fine particle wherein coarse ceramic particles is in the range between 20 –70 mesh and fine particle is smaller than 100 mesh and having an average size of 2 to 8 micron for the purpose of accommodating the fine particles in the space between the coarse

particles and forming smooth shaping surfaces for the moldings. It would have been obvious to one having ordinary skill in the art to provide Langer et al in view of Goldsmith the use of a particular relative size between the coarse ceramic particles and fine particle as taught by Goldsmith in order to effectively accommodate the fine particles in the space between the coarse particles and form smooth shaping surfaces for the moldings.

5. Claims 23-24 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Langer et al in view of Goldsmith and further in view of either Zoia et al or Smith et al.

Langer et al in view of Goldsmith fails to teach the use of optimal design including reinforcing ribs and cooling channels and support including back-fed ceramic material.

However, Zoia et al (col. 3, lines 3+) teach the use of optimal design including reinforcing ribs 100 and cooling channels for the purpose of controlling both strength and structure. Smith et al (col.4, lines 10+) teach the support including back-fed ceramic material such as unconsolidated mold 41 formed from alumina for the purpose of supporting the mold during casting. It would have been obvious to one having ordinary skill in the art to provide Langer et al in view of Goldsmith the use of optimal design including reinforcing ribs and cooling channels as taught by Zoia et al in order to effectively control both strength and structure and the use of support including back-fed ceramic material as taught by Smith et al in order to effectively support the mold during casting.

6. Claims 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Langer et al in view of Goldsmith and further in view of Kington.

Langer et al in view of Goldsmith fails to teach the use of matching the coefficient of thermal expansion between the casting mold and the supper alloys to be cast in the mold.

However, Kington (col. 1, lines 43+) teaches the use of matching the coefficient of thermal expansion between the casting mold and the Ni-supper alloys to be cast in the mold for the purpose of preventing porosity in the cast alloys. It would have been obvious to one having ordinary skill in the art to provide Langer et al in view of Goldsmith the use of matching the coefficient of thermal expansion between the casting mold and the Ni-supper alloys to be cast in the mold as taught by Kington in order to prevent porosity in the cast alloys.

***Response to Arguments***

7. Applicant's arguments with respect to claims 21-40 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ing-Hour Lin whose telephone number is (571) 272-1180. The examiner can normally be reached on M-F (9:00-5:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

I.-H. Lin

5-5-06

KEVIN KERNS
PRIMARY EXAMINER

Kevin Kerns 5/9/06